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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/086.904	02/28/2002	Jon Gelsey	042390.P13786	4050

7590 12/12/2005

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EXAMINER	
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ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 12/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/086,904	GELSEY, JON	
	Examiner	Art Unit	
	Raymond Alejandro	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 October 2005 and 16 November 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *65-98* is/are pending in the application.

4a) Of the above claim(s) *67-71,78 and 83-97* is/are withdrawn from consideration.

5)☒ Claim(s) *98* is/are allowed.

6)☒ Claim(s) *65-66, 72-77, 79-82* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

This office action is being provided in reply to the amendments filed on 10/27/05 and 11/16/05. The applicant has only overcome the objection and the 35 USC 112 rejection. Refer to the foregoing amendments for substance of applicant's rebuttal arguments. Therefore, the art rejections are herein maintained for the reasons of record.

Election/Restrictions

1. This application contains claims 67-71, 78 and 83-97 drawn to an invention nonelected with traverse in Paper No. 01/26/05 and 07/22/05 (election by original presentation). A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Note: *due to the extension of the present prosecution and multiple inexplicable claim amendments totally changing the scope of the present claim and/or claim cancellation, the burden is being shifted to the applicant to clearly identify what claims from the group of claims 83-97 are commensurate in scope with at least currently examined claims 65-66, 72-77 and 79-82 so that they (some of the claims 83-97) can be examined. So far, serious burden has been imposed by the applicant by constantly amending and/or canceling claims. Thus, the examiner will no longer track the subject matter of claims being unjustifiably amended (back and forth), and accordingly, applicant is required hereon now to fairly identify what claims from claims 83-97 and/or eventually-newly added claims should be examined based upon the restriction made early in the prosecution. Thus, applicant is requested to review and follow the history of the*

prosecution in order to further establish the specific grouping of claims (i.e. elected invention or non-elected invention).

Claim Objections

2. Claims 67-71, 78 and 83-97 are objected to because of the following informalities: the status identifier of the foregoing claims should be "*withdrawn*" not "*previously presented*" as they were found to be directed to a non-elected invention by original presentation. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim 65 is (*at least*) rejected under 35 U.S.C. 102(e) as being anticipated by Loffler et al 2002/0071797.

The present application is directed to an apparatus wherein the disclosed inventive concept comprises the specific hydrogen generators coupled to a fuel cell.

Loffler et al disclose a multiple modular reactor units or cells to provide a reactor for the reformation of hydrocarbon fuels for the production of synthesis gas or hydrogen (ABSTRACT). Loffler et al disclose a reactor for performing an endothermic reaction and an exothermic

reaction in adjacent isolated reaction chambers to supply the heat required by said endothermic reaction by said exothermic reaction (CLAIMS 1 and 10/ SECTION 0001 & 0011). It is disclosed that the heat produced by catalytic oxidation of fuel n the first channel is transferred to the second channel where a catalytic reforming reaction takes place (SECTION 0001 & 0011). Loffler et al is specifically directed to reforming of hydrocarbon fuels for the production of hydrogen (SECTION 0002).

Loffler et al further disclose that their multi-cell reformer apparatus will find wide industrial applicability, particularly in association with fuel cells (SECTION 0078). That is, Loffler et al's reformer finds particular use in connection with fuel cells (SECTION 0078).

Thus, *at least* claim 65 is anticipated.

5. Claim 65 is (*at least*) rejected under 35 U.S.C. 102(e) as being anticipated by Bunk et al 2003/0103880.

Bunk et al disclose an apparatus for carrying out a process of converting hydrocarbon fuel to a hydrogen rich gas controlling temperatures of reactor beds, managing heat and integrating the heat management in a simple and efficient manner (Abstract). Of particular interest, Bunk et al's invention is directed to an apparatus for converting hydrocarbon fuel into a hydrogen rich gas (Section 0006) wherein the illustrative embodiments the hydrocarbon reforming reactor includes a catalyst for reacting a fuel mixture under reforming conditions to give a hydrogen containing gaseous mixture; and wherein the catalyst may be either an auto-thermal reformation catalyst, a steam reforming catalyst or a combination thereof (Section 0007). Bunk et al disclose using their reactors in conjunction with a fuel cell (SECTION 0005).

Bunk et al teach that process step A is a reforming process in which two different reactions may be carried out (←***emphasis added***) (SECTION 0023). A partial oxidation reaction (formula I) which is exothermic (SECTION 0024); and a steam reforming reaction (formula II) which is endothermic (SECTION 0024). Moreover, Bunk et al makes known that the preferential oxidation is a reaction that produces heat and that it can be integrated with other process steps that are endothermic, for instance, steam reforming in Step A (SECTION 0044). *Thus, Bunk et al at once envisage the production of hydrogen by using both the endothermic reactor (generator) and the exothermic reactor (generator).*

Therefore, the prior art anticipates claim 65 (*at least*).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 65-66, 72-77, 79 and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Long et al 5702491 in view of Basch 3607066.

The present application is directed to an apparatus wherein the disclosed inventive concept comprises the specific hydrogen generators coupled to a fuel cell.

With respect to claims 65-66, 72, 79 and 82:

Long et al teach a portable hydrogen generator (TITLE/COL 1, lines 8-10/COL 12, lines 24-26) which utilizes both exothermic and endothermic reactions therein (COL 8, lines 1-17). Long et al disclose that hydrogen generator 10 includes a thermally isolated container 12 (COL 3, lines 62-67). It is disclosed that the heat generated by exothermic reaction of the $LiAlH_4$ is used to generate additional hydrogen by the endothermic thermal decomposition (COL 8, lines 1-17/COL 4, lines 2-9). Long et al teach that by providing a thermally isolated environment for the hydrogen generator, and by controlling the supply of water for hydrolysis and the temperature, the generation of hydrogen is maintained stable and controllable through balancing exothermic and endothermic reactions of Table III (COL 8, lines 8-13). It is also disclosed that by utilizing both exothermic and endothermic reactions in hydrogen generator 10, the typical problems associated with volumetric expansions are avoided (COL 8, lines 16-35). *Thus, the disclosed hydrogen generator itself is capable of being simultaneously used as both the exothermic hydrogen generator and the endothermic hydrogen generator*.

Regarding claims 73 and 75:

Long et al disclose that the primary candidates for use with the hydrogen generator as the primary chemical hydride includes $NaBH_4$ (COL 5, lines 57-63). It is disclosed that the ternary hydrides can be in liquid state (COL 5, line 60-61). TABLE II shows excess water reaction

(TABLE II). *Thus, it does encompass the formation of aqueous solutions of chemical hydride materials.*

On the matter of claims 74-75:

Long et al also makes known that metal hydrides can be used as the chemical hydride (COL 3, lines 8-16/ COL 3, line 67 to COL 4, line 9/COL 5, lines 49-56/ TABLE I).

With reference to claim 76:

Long et al further disclose that the generation of hydrogen is maintained stable and controllable through balancing exothermic and endothermic reactions (COL 8, lines 1-18).

Regarding claim 79:

It is also taught that hydrogen generated in the hydrogen generator is supplied for used to a fuel cell (COL 4, lines 54-60). Long et al teach fuel cells (COL 4, lines 54-60/ COL 5, lines 54-56). *It is thus noted that the thermal characteristics of the fuel cell are inherent to the same fuel cell application therein.*

Long et al disclose an exothermic and endothermic hydrogen generating apparatus according to the aforementioned. However, Long et al do not disclose the specific compartments; and the device coupled to the fuel cell to receive the power.

With respect to claims 65-66, 79 and 82:

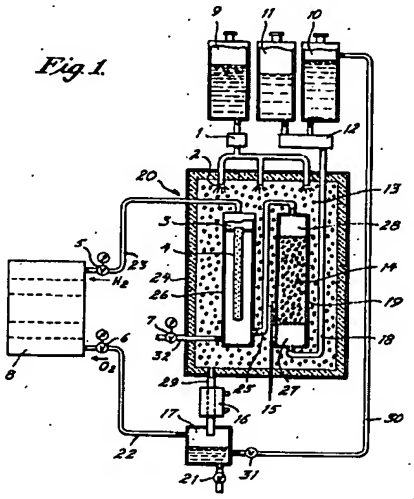
Basch discloses a process and apparatus for the simultaneous production of hydrogen and oxygen gases in which an oxygen generating compound is catalytically decomposed, the oxygen is separated and concurrently therewith a hydrogen generating compound is catalytically decomposed by means of the heat generated by the decomposition of the oxygen generating compound (ABSTRACT/COL 1, lines 60-72). In this process, the heat energy liberated in the

decomposition of one compound is directly utilized for heating the hydrogen-containing compound (COL 1, lines 60-72). *Thus, Basch at once envisages having heat transferred from one chamber into another to produce hydrogen.*

Basch discloses that his apparatus is for use in electrochemical fuel cells and fuel cell batteries (COL 1, line 3-7). It is further disclosed that, in the process, the hydrogen-containing compound is contained in suitable means which are in thermal transfer relationship with one converting means. Preferably, it is situated within the physical confines of the hydrogen compound decomposition means (COL 1, line 74 to COL 2, line 3). In particular, the apparatus comprises a decomposition chamber certain compounds and is in heat relationship therewith a converter for the decomposition or conversion of the hydrogen-containing compound and, if desired, other equipment or device for the generation and recovery of the hydrogen (COL 2, lines 10-25). It is further disclosed that said converter, and if applicable, said other equipment may be contained within said decomposition chamber, or if desired, it may be arranged in immediate vicinity thereto with the provision of means adapted to provide for the heat exchange between the interior of said decomposition chamber and said converter, and if applicable, said other hydrogen generating and recovery equipment (COL 2, lines 10-25). *Thus, Basch at once envisages having heat transferred from one chamber into another to produce hydrogen; as well as the use of more than one (1) hydrogen generating equipment* (← **emphasis added**) *as instantly claimed.*

Figure 1 below illustrates a diagrammatic representation of an integrated apparatus in which the hydrogen converter 19 is arranged within the decomposition chamber 24 and in which the generated hydrogen is directly fed to a fuel cell (COL 2, lines 26-30/ COL 5, line 10 to COL

6, line 14). *Thus, the hydrogen generating equipment is coupled to the fuel cell; and wherein the hydrogen converter 19 is disposed inside the decomposition chamber 24.*



As to claim 77:

As evident from Figure 1 above, the hydrogen converter 19 is coupled to a fuel cell 8 (FIGURE 1); wherein both the hydrogen converter 19 and the decomposition chamber 24 are connected to the fuel cell by tubing 23 and line 22 (*the ports*) (Figure 1 and COL 5, lines 15-25 and lines 49-60).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the specific compartments of Basch in the hydrogen generating apparatus of Long et al because Basch teaches that it is an object of his invention to provide an apparatus for the simultaneous production of hydrogen in a simplified and more economical manner; to provide an apparatus which is adapted for the carrying out of the combined process for the generation of hydrogen and oxygen gas in a single operation in an apparatus which requires less space than the apparatus of the prior art; and to provide an integrated apparatus which comprises the means of the simultaneous, continuous production of

gaseous hydrogen and oxygen in a more economical manner. Thus, Basch at once envisages having heat transferred from one chamber into another to produce hydrogen; as well as the use of more than one (1) hydrogen generating equipment (← **emphasis added**) as instantly claimed. *It is also noted that both Long et al and Basch are pertinent to one another as they both address the same problem of hydrogen generation for fuel cell applications. In addition, Long et al's teaching of employing two different hydrogen generation features is consistent with Basch's teachings of also using more than one (1) device or equipment for the generation of hydrogen. Thus, Basch's teachings envision adding more hydrogen generation devices therein.*

Moreover, it has been held that making a device/feature either portable, integral and/or separable is obvious. Succinctly stated, fact that a claimed device/apparatus is made portable, separable, integral or adjustable is not sufficient by itself to patentably distinguish over an otherwise old device unless there are new or unexpected results as it is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container was significant. In re Larson 144 USPQ 347, 349. In re Dulberg 129 USPQ 348, 349. In re Stevens 101 USPQ 284. In re Lindberg 93 USPQ 23.

9. Claims 65-66, 72-77, 79 and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Basch 3607066 in view of Long et al 5702491.

The present application is directed to an apparatus wherein the disclosed inventive concept comprises the specific hydrogen generators coupled to a fuel cell.

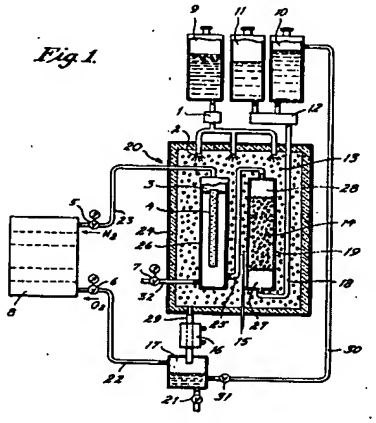
With respect to claims 65-66, 79 and 82:

Basch discloses a process and apparatus for the simultaneous production of hydrogen and oxygen gases in which an oxygen generating compound is catalytically decomposed, the oxygen is separated and concurrently therewith a hydrogen generating compound is catalytically decomposed by means of the heat generated by the decomposition of the oxygen generating compound (ABSTRACT/COL 1; lines 60-72). In this process, the heat energy liberated in the decomposition of one compound is directly utilized for heating the hydrogen-containing compound (COL 1, lines 60-72). *Thus, Basch at once envisages having heat transferred from one chamber into another to produce hydrogen.*

Basch discloses that his apparatus is for use in electrochemical fuel cells and fuel cell batteries (COL 1, line 3-7). It is further disclosed that, in the process, the hydrogen-containign compound is contained in suitable means which are in thermal transfer relationship with one converting means. Preferably, it is situated within the physical confines of the hydrogen compound decomposition means (COL 1, line 74 to COL 2, line 3). In particular, the apparatus comprises a decomposition chamber certain compounds and is in heat relationship therewith a converter for the decomposition or conversion of the hydrogen-containing compound and, if desired, other equipment or device for the generation and recovery of the hydrogen (COL 2, lines 10-25). It is further disclosed that said converter, and if applicable, said other equipment may be contained within said decomposition chamber, or if desired, it may be arranged in immediate vicinity thereto with the provision of means adapted to provide for the heat exchange between the interior of said decomposition chamber and said converter, and if applicable, said other hydrogen generating and recovery equipment (COL 2, lines 10-25). *Thus, Basch at once envisages having heat transferred from one chamber into another to produce hydrogen; as well*

as the use of more than one (1) hydrogen generating equipment (← **emphasis added**) *as instantly claimed.*

Figure 1 below illustrates a diagrammatic representation of an integrated apparatus in which the hydrogen converter 19 is arranged within the decomposition chamber 24 and in which the generated hydrogen is directly fed to a fuel cell (COL 2, lines 26-30/ COL 5, line 10 to COL 6, line 14). *Thus, the hydrogen generating equipment is coupled to the fuel cell; and wherein the hydrogen converter 19 is disposed inside the decomposition chamber 24.*



As to claim 77:

As evident from Figure 1 above, the hydrogen converter 19 is coupled to a fuel cell 8 (FIGURE 1); wherein both the hydrogen converter 19 and the decomposition chamber 24 are connected to the fuel cell by tubing 23 and line 22 (*the ports*) (Figure 1 and COL 5, lines 15-25 and lines 49-60).

Basch makes known an apparatus for the production of hydrogen gases for fuel cells as described above. However, Basch does not expressly disclose the specific endothermic-exothermic hydrogen generation configuration.

With respect to claims 65-66, 72, 79 and 82:

Long et al teach a portable hydrogen generator (TITLE/COL 1, lines 8-10/COL 12, lines 24-26) which utilizes both exothermic and endothermic reactions therein (COL 8, lines 1-17). Long et al disclose that hydrogen generator 10 includes a thermally isolated container 12 (COL 3, lines 62-67). It is disclosed that the heat generated by exothermic reaction of the $LiAlH_4$ is used to generate additional hydrogen by the endothermic thermal decomposition (COL 8, lines 1-17/COL 4, lines 2-9). Long et al teach that by providing a thermally isolated environment for the hydrogen generator, and by controlling the supply of water for hydrolysis and the temperature, the generation of hydrogen is maintained stable and controllable through balancing exothermic and endothermic reactions of Table III (COL 8, lines 8-13). It is also disclosed that by utilizing both exothermic and endothermic reactions in hydrogen generator 10, the typical problems associated with volumetric expansions are avoided (COL 8, lines 16-35). *Thus, the disclosed hydrogen generator itself is capable of being simultaneously used as both the exothermic hydrogen generator and the endothermic hydrogen generator .*

Regarding claims 73 and 75:

Long et al disclose that the primary candidates for use with the hydrogen generator as the primary chemical hydride includes $NaBH_4$ (COL 5, lines 57-63). It is disclosed that the ternary hydrides can be in liquid state (COL 5, line 60-61). TABLE II shows excess water reaction (TABLE II). *Thus, it does encompass the formation of aqueous solutions of chemical hydride materials.*

On the matter of claims 74-75:

Long et al also makes known that metal hydrides can be used as the chemical hydride (COL 3, lines 8-16/ COL 3, line 67 to COL 4, line 9/COL 5, lines 49-56/ TABLE I).

With reference to claim 76:

Long et al further disclose that the generation of hydrogen is maintained stable and controllable through balancing exothermic and endothermic reactions (COL 8, lines 1-18).

Regarding claim 79:

It is also taught that hydrogen generated in the hydrogen generator is supplied for used to a fuel cell (COL 4, lines 54-60). Long et al teach fuel cells (COL 4, lines 54-60/ COL 5, lines 54-56). *It is thus noted that the thermal characteristics of the fuel cell are inherent to the same fuel cell application therein.*

In view of these disclosures, it would have been obvious to one skilled in the art at the time the invention was made to use the specific endothermic-exothermic hydrogen generation configuration of Long et al in the apparatus for the production of hydrogen of Basch because Long et al disclose that such hydrogen generator employs an exothermic hydrolysis reaction and an endothermic thermal decomposition to provide a controllable generation of hydrogen from a container arrangement. Thus, the entire process balances the exothermic chemical reaction with the endothermic decomposition therein to provide a satisfactory generation of hydrogen. *In addition, Long et al's teaching of employing two different hydrogen generation features is consistent with Basch's teachings of also using more than one (1) device or equipment for the generation of hydrogen. Thus, Basch's teachings envision adding more hydrogen generation devices therein. It is also noted that both Long et al and Basch are pertinent to one another as they both address the same problem of hydrogen generation for fuel cell applications.*

10. Claims 80-81 are rejected under 35 U.S.C. 103(a) as being unpatentable over: a) Long et al 5702491 in view of Basch 3607066; and/or b) Basch 3607066 in view of Long et al 5702491 as applied to claims 65 above, and further in view of Corey et al 2004/0209137.

Long et al'491-Basch'066 and/or Basch'066-Long et al'491 are both applied, argued and incorporated herein for the reasons above. Nevertheless, none of the applied references expressly disclose the specific portable electronic devices.

Corey et al disclose that because of their ability to provide sustained electrical energy, fuel cells have increasingly been considered as a power source for smaller devices including consumer electronics such as portable computers and mobile phones (SECTION 0006).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to couple the specific portable electronic devices of Corey et al to receive power from the fuel cell apparatus of Long et al'491-Basch'066 and/or Basch'066-Long et al'491 et al as Corey et al discloses because of their ability to provide sustained electrical energy, fuel cells have increasingly been considered as a power source for smaller devices including consumer electronics such as portable computers and mobile phones. Thus, fuel cells are generally considered a viable power source for small devices such as portable computers and mobile phones. Thus, electrochemical energy conversion of fuel cells is useful to energize such energy powered devices.

Allowable Subject Matter

11. The following is a statement of reasons for the indication of allowable subject matter: a reasonable search for the prior art failed to teach or fairly suggest what is instantly claimed, in particular: the apparatus comprising first and second compartments including endothermic and

exothermic hydrogen generators, respectively, in association with a fuel cell and satisfying the specific structural and functional relationship as recited in claim 98.

12. Claim 98 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

13. Applicant's arguments filed on 10/27/05 and 11/16/05 have been fully considered but they are not persuasive.

14. With respect to applicant's arguments concerning the Loffler reference, the examiner respectfully disagrees with applicant's characterization of Loffler's teachings. Applicant's strict characterization thereof gives absolutely no room to envision that Loffler's teachings at once envisage the use of a reactor for performing an endothermic reaction and an exothermic wherein hydrogen is being produced or generated due to the reforming reaction taking place therein. The examiner re-affirms the position taken during the course of the interview on 11/16/05 (See Interview Summary of 11/22/05 for more information) and which was clearly explained to applicant's representative. The specifics of the interview including the telephonic conversation, as made of record in the above-mentioned interview summary, is being incorporated herein by reference. Thus, no further discussion will be provided by the examiner because, as stated by the applicant in the response of 11/16/05 at page 8, this subject matter was explained, conversed and described in that interview.

15. With respect to Bunk, a copy of the provisional application 60/311459 from which Bunk et al 2003/0103880 claims domestic priority under 119(e) is being facilitated to the applicant for his convenience.

16. Moreover, it is noted that applicant's submission is a substantial repetition of previously presented arguments. Therefore, since the arguments presented by the applicants in the foregoing amendments have been already considered and addressed by the examiner in prior office actions, it is unnecessary to keep addressing them. Thus, no further response to arguments is needed. Nevertheless, for the convenience of applicants, the examiner will repeat here the response to arguments included in the Advisory Action of 05/18/05 and final office action of 07/22/05.

17. With respect to applicant's arguments regarding the Election/Restriction, it is still contended that claims 67-71, 78 and 83-97 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: during this prosecution applicants initially elected to have examined the claims of Group I and particularly Species 2 (now cancelled claims 2-3, 10-14 and 24-29; and cancelled claims 30, 34-35, 37-43, 56-58 and 60-64) in response to the restriction requirement of 10/24/03 and 11/10/03. Accordingly, the examiner has currently identified and grouped claims 65-66, 72-77 and 79-82 as being directed to substantially the same subject matter of all cancelled claims. Thus, the remaining claims (claims 67-71, 78 and 83-97) are now deemed to be directed to mutually exclusive species claiming separate and/or distinct inventions, embodiments and/or characteristics. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly,

claims 67-71, 78 and 83-97 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03. ***See note above in the Election/ Restriction Section item 1.***

(***Emphasis added***→) Additionally, it is further noted that the subject matter of independent claim 83 appears to encompass either a different embodiment and/or a separate and unrelated invention at least because of different mode of operations or different functions (See also MPEP 806.04 and 808.01). For instance, the subject matter of independent claim 65 strictly requires the employment of both an endothermic hydrogen generator and an exothermic hydrogen generator so as to generate hydrogen by apparently the heat transfer therebetween; on the other hand, the subject matter of independent claim 83 does not require that the hydrogen generators be either endothermic or exothermic, in fact, it encompasses the use of any known hydrogen generator regardless of its functionality. Accordingly, the examiner reiterates that the inventions of independent claims 65 and 83, respectively, represent separate and unrelated inventions at least because they have different modes of operation or different functions.

Furthermore, applicant has not pointed out where the subject matter of claim 83 and its dependent claims are supported, nor does there appear to be a written description of the claim limitations "*endothermic and exothermic compartments*" and the use of "*any known hydrogen generator regardless of its functionality*" in the application as filed. That is to say, such claimed subject matter does not appear to be adequately described in the original disclosure. Yet more, after a thorough review of the specification as filed, it has been noted that it does not reasonably provide enablement for the combined use of respective endothermic and exothermic compartments and any hydrogen generators, that is, how the endothermic and exothermic

characteristic of the compartments can be used to positively affect any known hydrogen generator; what if: *a regular-standard hydrogen generator is included in the endothermic compartment*, or *an exothermic hydrogen generator is included in the endothermic compartment*, or *an endothermic hydrogen generator is included in the endothermic compartment* in combination with *a regular-standard hydrogen generator being included in the exothermic compartment*, or *an exothermic hydrogen generator being included in the exothermic compartment*, or *an endothermic hydrogen generator being included in the exothermic compartment*. Accordingly, the specification as filed does not enable the skilled artisan to produce hydrogen under some of the aforementioned possible combinations (e.g. *an exothermic hydrogen generator included in the endothermic compartment in combination with an exothermic hydrogen generator being included in the exothermic compartment*). Thus, the subject matter of claim 83 and its dependent claim would raise the issue of new matter.

18. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "*using an exothermic hydrogen generator in one compartment to transfer heat to an endothermic hydrogen generator in another compartment*") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). *It appears that applicants are attempting to conveniently accommodate the presently claimed language (i.e. first compartment and second compartment) to read as necessarily requiring the presence of two separate, divided, detached, unconnected or individual compartments. Indeed, the examiner has construed the presently claimed language as having an apparatus comprising two parts or two*

sections (i.e. not necessarily containers, enclosures or compartment physically separated from each other) configured to carrying out the exothermic and endothermic hydrogen generation in the same container. Additionally, it is noted that applicant admitted the following: "Long teaches that the primary and second chemical hydrides be included in the same container" (See amendment of 04/28/05 at page 10, 4th paragraph). Thus, it is verily believed that the prior art of record still meets both the functional and structural interrelationship to satisfy the claimed requirement.

19. In response to applicant's argument that "*Long discusses specific positioning of the chemical composition (i.e. "outlet of water conduit", "first chemical hydride*"), the fact that applicant has recognized another advantage/disadvantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). *In this particular case, the examiner points out that the Long reference has been cited in the office action to show the general concept of having a chemical apparatus configured to and adapted to exothermically and endothermically generate hydrogen per se.*

20. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). *In this case, both references (i.e. Long and Basch) are pertinent to one another as they*

both address the same problem of reliably providing generation of hydrogen for chemical applications and regardless the ultimate intended use thereof.

21. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). *This is to address* applicant's *intention of independently discussing the teachings of Long and Basch.*

Conclusion

22. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Raymond Alejandro
Primary Examiner
Art Unit 1745

RAYMOND ALEJANDRO
PRIMARY EXAMINER